OCTOBER 19

Cost and Management

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Official Publication of the Society of Industrial and Cost Accountants of Canada

THE FIELD IN WHICH WE SUPPLEMENT SUCCESSFUL MANAGEMENT may be indicated by some of the areas of our activity listed below.

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Editorial Comment . . .

OF recent years one paradox in our educational system has become increasingly apparent. At the same time as students are expected to become competent in one of a growing multitude of specialized branches of knowledge, they are expected to develop along broader lines as well. Along with a working knowledge of the task in hand, they are expected to cultivate a garden of the mind bordered with the humanities and trellised with such contemporary disciplines as sociology, psychology and economics.

In the business world, these latter are identified with the management arts as opposed to the "clerky" arts. Besides a knowledge of the specialist techniques of his profession, the industrial accountant must have a broad comprehension of the socio-economic forces at work in the world today, if he is to serve management wisely or to rise to high management status himself.

In our predominantly economic world where, in a democratic system, all technological progress goes hand-in-hand with business progress, the industrial accountant becomes an increasingly important man. It is he who interprets the business to management in financial terms and on the basis of this information, many important decisions are made.

As industrial accountancy moves more and more into the management sphere, the problem of education for management becomes intensified. The dilemma of the day—how to combine specialization with a liberal education—takes on particular significance for the industrial accounting profession.

Though our special concern is with management and industrial accountancy, this is not a problem for our profession alone. Before we can achieve the desired goals, in education for R.I.A. certification we must consider the whole pattern of business education in this country. We must determine whose are the responsibilities and what the goals before we can proceed full speed ahead in developing an educational program suited to the specific needs of our times. This is a problem that has been given considerable attention of late. The seminar on *Goals and Responsibilities in Business Education* given at the University of British Columbia last fall (in which S.I.C.A. was represented by our president whose article appears in this issue) was devoted to that problem.

On the one hand we have a multiplicity of professional organizations, business schools and company training programs, each with its own organization, goals and special blend of practical and theoretical education. On the other hand we have the universities, the traditional guardians and perpetuators of intellectual thought who have now moved into the field of business education, as is well and fitting, in response to the popular demand.

With such a diversity of organizations, it seems inevitable there will be some overlapping of functions. This in a way may be a good thing; it insures that alternative

Published Monthly by the Incorporated 1920

SOCIETY OF INDUSTRIAL AND COST ACCOUNTANTS OF CANADA
Editorial and Business Offices: 31 Walnut Street South, Hamilton, Ontario
J. N. Allan, R.I.A., Executive Vice-President and Editor

Subscription price to non-members, $5.00 per year. Single copies, 50 cents
Members desiring five copies or more of a single issue, may obtain them at 25 cents each.
Opinions expressed by articles and comments are not necessarily endorsed by the Society of Industrial and Cost Accountants.
Authorized as second class mail, Post Office Department, Ottawa.

points of view and methods are given recognition. But at the same time we, as a profession, have a responsibility to assure that the diversity does not lead to confusion and inadequate training for our members.

Within the accountancy profession there is a parallel division of bodies. Our aim should be to consolidate ourselves as a profession in order to work most effectively with the other agencies, particularly with the universities, in furthering business education. Were the accountancy profession to present a united front with a number of specialized branches the problems of duplication and, consequently, of wasteful use of finances would be largely eliminated, yet the advantages of diversity and its healthy range of viewpoint would remain.

With closer cooperation between the divisions of accountancy, closer cooperation with the universities would likely follow. While the profession, being closer to the problems, can best specify those qualities of character, skills and knowledge that are a necessary minimum for proficiency in the calling, the universities are best equipped by training, experience and facilities to carry on the vital functions of teaching and research—the two activities that safeguard the future vigor of our professional life.

Hence we can see a clear division of labour in the future. We feel that decision on the courses and the tests for admission to membership must be made by the professional body and that certificates should be granted only by them, but that advice and suggestions on these, in addition to the teaching, should be supplied by the universities. Thus while there are clean cut responsibilities, cooperation between the university and the professional body is essential for the maximum effectiveness of professional growth and development.

With the need for broader education for management developing within the industrial accounting profession, we would like to think that many universities across the country would be warmly disposed to such a division of responsibilities and be responsive to this cooperative view.

PERSONALS

J. E. WALSH, C.A., a member of the Ottawa Chapter, has been appointed Director of Finance, Purchasing and Stores, Department of Veterans' Affairs. Mr. Walsh was formerly associated with Arthur A. Crawley and Company, Chartered Accountants.

GEORGE MOLLER, D. Jur., C.A., R.I.A., of the Hamilton Chapter, has been appointed Vice-President of H. H. Robertson Co. Limited, the holding company of Robertson-Irwin Limited and Robertsteel (Canada) Limited. Mr. Moller will continue to serve as an officer and director of each of the three companies.

F. W. NAYLOR, R.I.A., has been appointed Administrative Assistant to the Vice-President and Division Comptroller of the Steel Fabrication and Manufacturing Division of Dominion Steel and Coal Corporation. Mr. Naylor is a member of the Quebec Chapter of the Society.

N. TOKARYK, R.I.A., of the Ottawa Chapter has been appointed Treasurer of Defence Construction (1951) Limited. Mr. Tokaryk has been associated with the Crown Company since October 1952.

B. STOKES, B. Comm., C.A., has been appointed Secretary-Treasurer of CIBA Company Limited, Montreal. Mr. Stokes is a General Member and a Director of the Montreal Chapter.

MEDAL WINNERS . . .

F. B. Grant

J. E. Uberig

G. N. Morenz

The Society is pleased to announce the winners of the two national awards for high achievement in the final examinations.

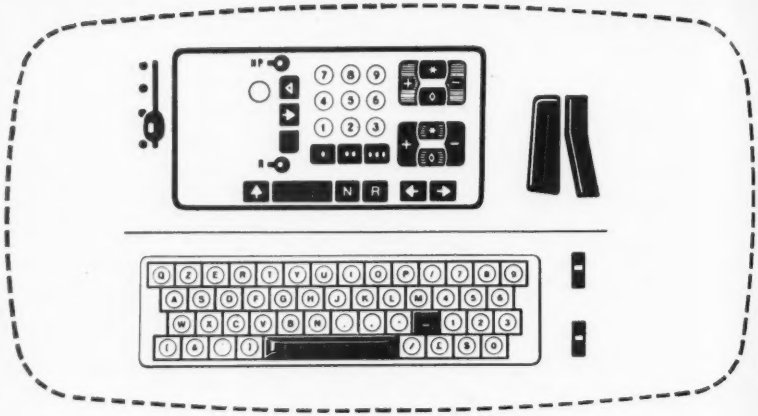
The H. M. Hetherington Gold Medal, given for the highest marks in the Advanced Cost Accounting examination across Canada, was won this year by F. B. Grant of Calgary.

Two students tied for the D. R. Harrison Gold Medal, awarded for the highest marks in Canada in the Fundamentals of Cost Accounting examination: J. E. Uberig of Hamilton and G. N. Morenz of Brantford. Mr. Uberig and Mr. Morenz also tied for the H. P. Wright Gold Medal, given for the highest marks in Ontario in this subject.

The award caps an outstanding student record for Mr. Grant, who previously won awards for obtaining the highest average in Alberta in four R.I.A. subjects. Following five years of employment with United Grain Growers, he joined Pacific Petroleums Ltd. in 1956 and is presently General Accounting Group Supervisor there.

J. E. Uberig is Assistant Accountant with the Hamilton Spectator. On graduating from Westdale Secondary School in 1950, he was employed for several years as an accountant with the Royal Bank and later with the Hamilton Hydro Electric until he joined the Spectator in 1956.

A graduate in Higher Accountancy of LaSalle Extension University, G. N. Morenz began R.I.A. studies in 1955. He has held senior accounting positions with several firms in Brampton and Toronto and is presently Cost Accounting and Supervisor of Production Planning and Control, Fibre Products of Canada Ltd., Brantford.



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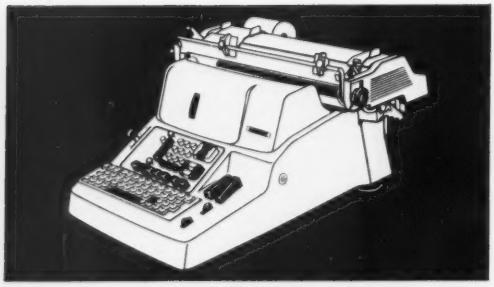

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PROFIT DETERMINATION BY PRODUCT GROUPS

By Lyle M. Farmen,
Manager, Accounting Department,
R. T. French Company,
Rochester, New York.

Of increasing interest to management are the profits made by individual product groups and the return on investment which they show. Segregation of total profits by product groups not only shows which products are lagging, but it also shows which groups may warrant additional investment. Moreover, this type of profit analysis results in more accurate costs, since possible cost inaccuracies will be pinpointed, if the expected profit for a product group does not materialize.

In addition to the usual Profit and Loss Statement and Balance Sheet, many managements are becoming more and more interested in two other reports, namely:

1. Profit by Major Products Groups
2. Return on Investment by Major Product Groups

Both reports are aimed at more information about individual product groups to see which lines are making satisfactory profits and which groups warrant additional investment or should be eliminated. While the Profit and Loss Statement serves its purpose, it represents the company as a whole and tends to shield those products that are not making a profit.

Both of these reports require an accurate breakdown of profit by product groups, and this will be the main objective of this paper. If a company has ten major product groups, total profit will be broken down into ten units. In most cases, product groups follow departmental lines.

To break down the Profit and Loss Statement into ten different groupings, the following steps must be taken:

1. SALES BY PRODUCT GROUPS—This should be a fairly easy breakdown because company sales statistics are usually arranged in this manner.
2. CASH DISCOUNT—Easily accomplished by multiplying the established cash discount percent for each group to the sales of the group.

Lyle M. Farmen has been associated with the R. T. French Company since 1948 and has been Manager of the Accounting Department since 1950. He is a graduate of the College of Wooster and Harvard Business School. Mr. Farmen is a member of the Rochester Chapter of the National Association of Accountants.

3. FREIGHT ON SALES—This can be a laborious job or a fairly easy one depending on your individual setup. If pounds of product sold are available, and you have the freight rates, it merely becomes a long extension job. Usually, however, you will find that, based on past performance, you may apply freight as a percent of sales and allocate to all products any remaining balance.
4. SELLING AND ADMINISTRATIVE EXPENSE—This is an area in which the average person usually takes the easiest way out by applying these expenses as a percent of sales. While this is not the most accurate method, it will have to suffice for the purpose of this report as it is a subject in itself.
5. ADVERTISING EXPENSE—This is usually readily available by product groups.
6. COST OF SALES—This covers a multitude of costs and because of its importance in determining profit by product groups, will receive special treatment.

COST OF SALES

This paper is based on a standard cost system which includes the following items of cost in cost of sales:

1. Factory cost for each product made up of
   a. Labour at standard cost
   b. Raw and Packing Material at standard cost
   c. Overhead at standard cost
2. Manufacturing Variance—includes labour, quantity, overhead and volume variances.
3. Price Variance on Raw and Packing Material.

The factory or standard cost for each product should be available from regular accounting records and therefore need only be summarized by product group.

Variances, both price and manufacturing, are of a different nature; and if sizeable, can play a tremendous part in determining the profit on individual products, depending on how the variances are charged or allocated. These two items require special study to guarantee profit and fair product profits.

MANUFACTURING VARIANCE

Manufacturing variances are usually accumulated in accounts by departments. If the major product groups follow departmental lines completely, the problem of assigning manufacturing variance is a fairly simple one. This, however, is not usually the case. Many products usually pass through several manufacturing departments and therefore should receive a portion of the variance in these departments. Likewise, one department may make more than one product and each product should share the variance.

Let us assume that Department No. 16 makes two different products and that the manufacturing variance for the period is a $12,000 loss. An analysis of the variance shows that $2,000 was due to a labour loss on product A and a $6,000 loss was due to material spoilage on product B. The balance of the loss—$4,000—is due to unknown reasons, probably connected with unabsorbed overhead. This balance has to be charged

somewhere, and the logical thing is to allocate it to the products made in the department. The variance schedule would then be as follows:

	TOTAL
Labour Loss—Product A	$ 2,000
Material Spoilage—Product B	6,000
Total Variance Applied Direct to Product	8,000
Balance to be allocated	4,000
Total Variance	$12,000

	VALUE OF PRODUCTION	%	VARIANCE
Product A	$75,000	75%	$3,000
Product B	25,000	25%	1,000
Total Product	$100,000		$4,000

The end result is that product A is charged with $5,000 variance and product B with $7,000 as per the following:

	PRODUCT A	PRODUCT B	TOTAL
Variance—Applied Direct	$2,000	$6,000	$8,000
Variance—Allocated	3,000	1,000	4,000
Total Variance	$5,000	$7,000	$12,000

The more different product groups passing through any one department, the more difficult it becomes to charge variance in a fair manner to the proper product. Unless you have the staff to completely analyze manufacturing variances, you will almost always end up with a good portion of the variance that you don't know what to do with. In many similar allocation problems, the easiest method is often as fair as a more complicated one.

All of the above precludes the fact that overheads are properly allocated to departments, especially service department overheads such as receiving, power, heat, factory office, etc. Other elements of the factory cost, namely, labour, raw material and packing material are fairly accurate. Overhead, however, is usually applied to product costs on the basis of direct labour hours or dollars or some other method. Included in each department's overhead rate is a large charge for its share of the expenses of the service departments. In many companies this share of the service departments' expenses is the largest single item of a manufacturing department's overhead. If this is the case, a fair allocation of service departments' expenses is necessary or the resulting profit margins are not fair or accurate.

This paper does not intend to go into the ramifications of allocating service departments' overhead to manufacturing departments because it is a subject of much debate in itself. However, the point is maintained that this cost area should be examined thoroughly before the profits per accounts are distributed to product groups. Otherwise, some products will receive too great a share at the benefit of other products.

PRICE VARIANCES

On the surface, the use of price variance accounts appears to solve one of the major problems of a standard cost system. The idea behind this false assumption is that price variance has been segregated from other manufacturing variances, thereby easing the cost accountant's job. What usually happens is that the price variance account ends up as a catch-all for all charges that no one knows what to do with. If you have just one price variance account, this account must be analyzed for a proper distribution to the product groups. This problem can be partially solved by having two major series of price variance accounts, one for raw material and one for packing material. In turn each of these series would have a separate price variance account for each product group. If you have ten product groups, you would have ten raw material price variance accounts and ten packing material price variance accounts. Even if you planned no further analysis, by using this method you would at least have a fairly accurate system for charging product groups.

The price variance would be charged to the price variance accounts in one of the two generally accepted methods:

1. If material ledgers are costed at actual cost, charge material to departments or process at both actual and standard cost, the difference going to the price variance account.
2. If material ledgers are costed at standard, enter the material to the ledger at standard cost and charge the difference between standard and actual cost to the price variance account. This can be done on the original invoice or voucher.

Using the price variance arrangement does not solve all your problems. In many cases, several products may use a common material. The price variance on this material must be fairly apportioned to all products using it. In addition, each price variance must be analyzed to determine which materials are causing the variance. As in other areas of cost accounting, the amount of effort expended on this job depends on the amount of money involved. Small price variances would probably be charged directly to product groups. Larger variances would be analyzed for proper distribution and as part of the explanation as to why a product group's profit is greater or smaller than that forecast.

For example, an analysis is made of the raw material price variance account for product A. The analysis shows that the actual cost of a major raw material is considerably over the standard. This is the signal that the standard cost needs revision. What deviation from standard is considered great enough to change a standard? If standard costs are used to value inventories for raw, packing and finished goods, a 5% deviation from standard should be adopted as the rule. This allows some flexibility in the standard costs, but also assures you of having the inventories priced fairly and accurately. This point is very important. As mentioned previously, the standard cost of sales for the products is charged directly to product groups. If these standards are in error, the resulting profits are in error and the final report gives false facts to management.

INVENTORY ADJUSTMENTS

Not mentioned previously, but also important, is the effect of inventory adjustments on profits. These adjustments can be caused by quantity or price. In most inventory

adjustments they may be linked directly with the appropriate product group and cause no special problem.

CONSISTENCY REQUIRED

Several methods already mentioned, such as allocation of variance, are constantly subject to review and revision. Improvement is always welcome as long as radical changes do not prohibit a comparison with prior years' operations.

PROFIT ALLOCATION AFFECTS INVESTMENT

Anyone who has worked on reports for Return on Investment realizes that many allocations of fixed assets are necessary. Buildings and machinery for specific departments require some allocation based on the products made in the department and the allocation will follow in the same manner as variance allocations. Buildings and machinery used by the service departments pose a different problem. However, these assets must be charged to product groups. If the basis for charging the expenses of service departments to manufacturing departments is fair, chances are that you can use the same basis for allocating the fixed assets to manufacturing departments. This point is raised only to emphasize the importance of using a proper method to allocate service expenses.

CONCLUSION

The segregating of total profits by product groups results in more accurate costs because costs are brought out into the open. If cost estimates show a product should be making a 25% profit margin and the report shows an actual margin of only 15%, management will be asking questions. A restudy of this product's costs might disclose the use of wrong factory costs, erroneous freight charges, an unfair share of price or manufacturing variances, etc. All of these items are important when studying profit margins or return on investment.

Profit determination has been stressed in this report because it is applied both to sales and to total investment to obtain the percent profit on sales and investment. To provide accurate information, the profit for each product group should, therefore, receive more than usual emphasis to have it as reasonable as possible.

For further reading

ONE APPROACH TO USEFUL PRODUCT PROFIT STATEMENTS, by W. A. Kerns, N.A.C.A. Bulletin, April 1956.

PRODUCT GROUP PROFIT REPORTING FOR MATERIALS WHOLESALERS, by W. Lewis, N.A.C.A. Bulletin, Feb. 1953.

PROFIT EVALUATION FOR MANAGEMENT. A Panel Discussion. N.A.A. Bulletin, Sept. 1957.

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CHARTERED ACCOUNTANTS

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Philip T. R. Pugsley, C.A.
Donald R. Patton, C.A.
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Mr. H. A. MacDonald
Vice-President
Dominion Reader's Service Limited

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Yours very truly,

H. A. MacDonald.
Vice-President

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UNDERWOOD SAMAS

TOPICAL comments

by N. R. Barfoot

LOOKING AHEAD

PRODUCTIVITY IN PLANTS may be doubled in the future if a new system of on-the-job instruction is used. Tape recordings are the answer, say the makers, and they make blueprints and working drawings superfluous.

JET AIRLINERS will be in operation before year end in the United States. Prices range from $1 million for domestic types to $5.5 million for the trans-Atlantic trade. They will cruise at 600 m.p.h. and get to Europe in six hours. If full loads are carried (130 passengers), three trips every 24 hours are theoretically possible. Flying eight miles above the earth, they will consume 12,000 lbs. of fuel per hour. T.C.A. will put DC 8 jets into service in 1960.

DECLINE OF '57-58 HAS ENDED according to latest evidence—exempli gratia—housing starts in Canada ran 6,090 above year earlier totals during first five months this year.

RAILWAY CAR LOADINGS, after a long decline, showed marked improvement with a 7.7% year-to-year advance.

THE WORK WEEK HAS LENGTHENED and it is predicted will increase this Fall. The economy will probably stay close to current levels for some months, barring violent changes on the international scene.

ON THE PERSONAL SIDE

70% OF ALL MEALS are served in the kitchens, including 40% of guest meals. A recent survey established the above facts, disturbing as far as architects are concerned; one might ask the raison d'être of dining rooms.

CARS FOR 1959 will be all new looking once again. This is the lesson of 1958. Emphasis will be more on looks than mechanics. More fins, higher fins and flared fins will be seen. Headlights will be grouped in pairs, evenly spaced or slanted one above the other. More compound windshields will be used. Bodies will be longer, lower and larger, with some medium-priced cars within fractions of an inch of the largest. Pneumatic suspensions did not find any great acceptance and may not be offered in some models. Liquid-cooled brakes are a possibility for 1959. They will solve the long-standing problem of overheating and fading. More use of anodized aluminum in grills and trim will be made and in colours other than the current silver and gold finishes.

The automotive producer will be selling hard in 1959 and basically on styling.

A RECENT MEDICAL CONVENTION of stomach specialists disclosed that truck and bus drivers get more ulcers than business and professional men. Smoking delays the healing of ulcers. One in ten North Americans will get ulcers and more often men than women; half a century ago, the opposite was true. People who eat on the run do not necessarily get ulcers, nor does it matter much what you eat. Peptic ulcers may be hereditary. More ulcers occur in the Spring than any other time.

OF GENERAL INTEREST

Business failures last year in Canada were less than 1%. 1,498 out of 253,900 establishments went to the wall.

General reasons in order of importance were poor management, incompetence, unbalanced managerial experience and lack of experience in the line. Management shortcomings accounted for 96.9% of all failures. Fraud, neglect and disaster played a very small part.

Some specific causes were: inadequate sales 771 companies, receivable difficulties 388, competitive weakness 357, financial mismanagement such as inventory problems and excessive fixed assets 338, poor location 98 and heavy operating expenses 76.

The record shows the third and fourth years are the most dangerous in the life of a new company. Firms surviving five years or more are much less likely to go under.

Alberta shows the sharpest increase in numbers of failures and mainly retailers. By way of observation, only 12 undertaking establishments have failed in the last 15 years.

THE CHEMICAL INDUSTRY is still forging ahead. Sales in 1957 were $1.2 billion compared to $.4 billion in 1947.

- About $1 billion has been spent on new and expanded plants in the last 10 years; most of it on petro chemical units at Sarnia, Montreal and Edmonton.
- This year, capital programs will be completed at a cost of $150 million.
- There are 1,140 plants employing over 54,000 people in the chemical trade.
- Biggest gains this year were vegetable oils up 42.7%, heavy chemicals 17%, compressed gases 15%, plastics 12.2%, medicinals 12.2%, adhesives 10.6%. Fertilizer and toilet preparations declined.

STEREO RECORDS are on the market. Stereophonic sound reproduction purports to give an illusion of spaciousness and sense of direction. This is accomplished by recording and reproducing two separate sounds. The record has a V-shaped channel with a sound channel on both sides. Reproducing is, of course, by two speakers separated so as to project sound to the listeners from two different directions.

Stereo discs can be played (with proper cartridges) on standard machines with a single speaker. Prices of stereo cartridges are very little more than the present monaural type.

Separated speakers are available as a unit as well as complete stereo sets. Results are entirely dependent on distance between speakers. If placed too close, sounds merge and stereophonic effect is lost. If too far apart, there appears to be a hole in the middle of the sound. Considering the special acoustical properties inherent in every room due to furniture, size, wall texture etc., proper placement of speakers can be a problem.

Advance information shows considerable enthusiasm for use of this equipment in the home. It has been well known for some time in theatres and halls.

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OUR FUTURE IN THE PROFESSION

By M. C. Coutts,
Director and Vice-President, Manufacturing,
Sangamo Company, Toronto.

In this article the criteria of a profession are examined with reference to our own Society and some of the factors on which the author believes our professional future will depend are reviewed. Among these, he perceives a growing need for more unification, higher levels of education, and greater public service and points out how the world-wide trend toward these objectives is being evidenced in the accountancy profession both at home and abroad.

I hold every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty endeavour themselves by way of amends to be a help and ornament there unto.

The above statement was penned by Sir Francis Bacon about 350 years ago. I quote it here since I'm sure that it covers the spirit motivating most accountants and because of my belief that some mutual thought on this subject may lead to valuable contribution to our profession.

While I first wish to cover a little background about our rate of growth and to question the idea of calling ourselves a profession, I want to dwell mainly on the general theme that our future in the profession is dependent upon unification, a higher level of education, and public service.

GROWTH

"The growth of the profession is probably without precedent in our social and economic history." This statement is made in a report drawn up by a public relations firm for the Certified Public Accountants in the U.S.A. about a year ago under the title of *The General Recognition of Accountancy as a Profession.* Now, of course, this article was equating the profession to the Certified Public Accountants in the U.S.A. In any case, however, it bases this conclusion on the fact that between 1920 and 1955 the number of C.P.A.'s increased some 20 times as fast as physicians and 12½ times as fast as lawyers.

Undoubtedly some such figures could be assembled for Canada. However, I do not think we need them to support our general point that we have grown and are growing at a very high rate. It is interesting to observe that for the year 1956-1957 the R.I.A. membership increased by 9.3%, the C.A. membership by 8.2%, and the Professional Engineers by 9.2%. At the same time our student enrolment increased by 13% as against 5.4% for the C.A.'s. A basic element in all these figures, however, is the fact that we are the youngest of these groups. We are, for instance, about 40 years younger than the C.A.'s

---

A Registered Member of the Society since 1945, Maxwell C. Coutts served as President of the Canadian Society last year. He is also active in committee work and in the affairs of the Ontario Society, serving as its President in 1952-53. Director and Vice-President, Manufacturing, of Sangamo Company, Toronto, Mr. Coutts is a graduate in engineering of M.I.T. and holds a B.Sc. Com. degree from the University of Toronto.

—at least from the birth dates of the organizations. And while our registered membership is only 13% that of the C.A.'s, our student membership is probably now slightly in excess of theirs.

PROFESSIONAL RECOGNITION—A REAL CHALLENGE

What group is the profession? One is struck by the extent to which we speak of ourselves as the profession and the apparent lack of recognition of such status by many other important bodies. The word profession, in this instance, can have more than one meaning. I believe that in the U.S.A., the C.P.A.'s would claim to be the profession —thinking more particularly about public accounting.

In other quarters recognition is given to other groups, particularly those serving management within companies as well as public accountants; it seems to me that where this is the case the terminology used is—the profession of accountancy. It is clear that to make progress in the direction of a profession, this matter of designation will have to be clarified and standardized in our communications.

Varying statements have been made about the essential characteristics of a profession. Prof. Byrd, Professor of Accounting at McGill, has dealt with some of these in the May 1954 issue of the *Chartered Accountant*. He points out that—"The National Labour Relations Act in the U.S.A. defined a professional employee as one having knowledge of an advanced type in a field of science or learning customarily acquired by a long course of specialized intellectual instruction and study in an institution of higher learning." *Fortune* said that a trade is a profession only if, in addition to all else, it is powered by a sense of mission. A distinguished legal authority, Lord Simon, cites three essentials:

1. Education in principles.
2. Capital represented by personal abilities and reputation rather than money.
3. Service to the community above personal reward.

I'm sure there is a good basis for speaking of the Accountancy Profession. This aspect was the subject of a special study carried on for the American Institute of Accountants a few years ago, and in their report we find this paragraph:

> "But there is some evidence that the certified public accountants may not yet have won general public recognition that they constitute a profession rather than a highly technical and specialized vocation. This is unquestionably due primarily to two factors: it is a new profession without the long tradition of the law or medicine; and its normal contacts are much less with the general public than with relatively small elements of the public."

Part of my basis for recognition, even at this stage in our history, is the fact that degree accountants are admitted to membership in the one organization covering all types of professional people—The Torch Club.

Again, if you look for the number of professional accountants in the *Canadian Census*, you find that the professions are listed alphabetically and that the first profession given is "architects". The information about accountants is given under the list of service classifications—accountants and auditors.

Again, a report dated November 1956 issued by the Department of Labour, Unemployment Insurance Committee, entitled *Requirements for Professional Personnel 1956-1958* has this statement:

> "In 1956-58 requirements for degree accountants (C.A., C.G.A., C.P.A.) are expected to increase at an average annual rate of 8.5%."

Here we find degree accountants included in the broad study of professional personnel requirements but we find our own designation omitted and apparently unrecognized in the study.

It's pretty clear from the foregoing statements that we have a real challenge ahead of us if we are to make progress in this general area of professional recognition.

NEED FOR AND TREND TOWARD UNIFICATION

As I stated at the beginning, it is my feeling that every accountant wishes to do his best to help the advancement of the profession. It is my contention that the best way to do this is to promote a unification of the various branches of the profession and to promote even higher standards of education for our degrees.

Let us begin by considering this matter of unification. I think we can support the view that not only is this absolutely necessary but that progress toward it is being made slowly.

One of the most powerful statements of the need for unification was made in the report to the C.P.A.'s in the U.S.A. on their recognition as a profession. The report told them that the first, and perhaps the most troublesome, problem facing them in connection with general public recognition was the matter of generic terminology. In essence they were told that, while they were the only group in the entire field with the requirements of a profession, they could not escape some sort of responsibility for the activities and claims of several hundreds of thousands practising in the whole field of accountancy.

A similar statement is made by Prof. James B. Bower of the University of Wisconsin in the April 1957 issue of the *Accounting Review*. His conclusion is that the professional accountant, i.e. one engaged in public accountancy—as certified public accountants are engaged—is too narrow and that a profession of accountancy should exist if practitioners are to receive full professional recognition and status.

Again, George Moller, one of our valued members, in an editorial in the September issue of *Cost and Management* makes the following statement:

> "It seems inevitable to us that the professional status of the accountant can not remain confined to the practising public accountant, but that industrial accountants must strive to fulfil increasingly the requisites for professional men and take their rightful place in one of the specialized branches of the all-embracing profession of accountancy."

In Canada it seems to me that the need for unification is pointed up through the multitude of accounting organizations that do exist. Aside from being confusing, I'm sure that this must also be distressing to most businesses and individuals, if only from the angle of wasteful overlapping, duplication, financing and effort.

Surely the matter of ethics, the discipline of members, the authority of pronouncements would be tremendously strengthened if the means existed for one professional voice.

SOME FAVOURABLE DEVELOPMENTS

The first step towards a solution is an awareness of the problem and it seems clear that this problem is being increasingly recognized, and in fact, there are favourable developments already observable toward the desired end. I believe that one of the great factors working toward this end is the International Congress of Accountants. Here is a world focal point for the profession—all organizations covering accountants. Here the oppor-

tunity exists for far-sighted, imaginative views to be exchanged and for worthy objectives to be advanced. That this is a meaningful association is indicated by the following paragraph from the 1956-57 annual report of the Canadian Institute of Chartered Accountants:

> "In September of this year, accountants from all over the world will gather in Amsterdam to discuss recent developments in accountancy. It is gratifying to report that our Institute was asked to appoint a representative on three of the six formal panels. Mr. J. A. de Lalanne, First Vice-President of the C.I.C.A., Mr. Lawrence Macpherson, Director of Research, and Mr. W. L. McDonald, former president of the Ontario Institute, will act as spokesmen for the profession, and a large number of Canadian chartered accountants is expected to attend."

Another evidence of this trend toward unification is seen in Australia. In the annual report for 1956 of the Australian Society of Accountants we find this paragraph:

> "A further major development in the consolidation of the profession occurred during the year when the members of the Australian Institute of Cost Accountants approved of the affiliation of the Institute with the Society. This has provided the means of integrating the basic functions and services of the two organizations. It will enable the Institute to devote its efforts wholly to the further advancement of cost accounting and its value as a tool of management. Members who specialize in the study of cost accounting will gain in status from the arrangements and the business community will be provided with improved services."

One of the noteworthy points about this consolidation is that the Australian Society of Accountants reports a membership of 20,598 as against a combined total for the C.A.'s and ourselves of 13,242, i.e. 50% more.

NEED FOR AND TREND TOWARD HIGHER EDUCATIONAL STANDARDS

In a publication from U.S. Steel entitled *Industrial Accounting Careers in U.S. Steel*, the Chairman of the Finance Committee, E. M. Voorhees, makes the following statement:

> "Industrial Accounting, after a period of significant development in the larger businesses of America, has emerged as an effective tool for management. The Accounting Department by using the records as a foundation, has added interpretive, analytical, and projective services, and, in fact, has provided new eyes for management. Through this development Industrial Accountants have been drawn into the planning, decision making, and controlling steps of both general management and departmental management. In the modern business organization the Accounting Department has left its former shell of record keeping and financial reporting, and actively participates in the determination and execution of management policies."

Underlying this viewpoint is the need to recognize the fundamental changes taking place in business—the rapidly accelerating rate of technological change. There's probably no need to elaborate on this but it has had three significant by-products: first, the necessity of quick and accurate decisions; second, decentralization of much important decision making; and third, the need for effective relationships between people to give team work. The position of the controller with broad administrative responsibilities is one expression of this situation, as indicated by W. M. V. Ash, President of Shell Oil Company, speaking before the Toronto Chapter of the Controllers' Institute in October 1957.

At the same time the need has increased for the specialist or the expert within the Controller's department. For instance, I remember meeting a top level Industrial Accountant from the U.S. Du Pont Company, and his position in one of their plants was that of Capital Expenditure Analyst. The complex situation arising out of the new opportunities to process data swiftly also leads in this direction.

That continuing education toward professional performance is necessary as a broadening factor is illustrated by the program of study offered by the Engineering Institute of Canada—their purpose is stated as "to assist an engineer to become a well-informed, interesting person, who will be a credit to his profession. The subjects Public Speaking, Citizenship, Psychology, Politics, and Business Management help to stimulate personal and social development and understanding of business affairs."

Education for engineers is being intensively studied and conclusions in this field have some relevancy to requirements for accountants. In this connection Professor Gunning, Dean of the Engineering Faculty at the University of British Columbia, pointed out the following trends in November 1957:

(1) More emphasis on skill in the basic sciences.
(2) Less specialization on engineering techniques.
(3) Increasing breadth of training—English, history, economics, philosophy, psychology.

In addition, Dean Gunning emphasized that in his view general training involving the history and experience of mankind was essential. I believe it is fair to say that we can learn much from the study of developments in older professions such as the engineers.

In a recent report published in the June 1957 issue of *Cost and Management*, Calvin Potter concludes with this statement:

"As a corollary to the importance of costs to-day, the person responsible for computing such costs has effected a break through onto the management team. Whereas previously the accountant's status was that of a clerical type service, to-day it is of a professional type. In addition to his traditional duties of measuring the results of operations, the accountant is responsible for assessing proposals regarding innovations, and where such proposals backfire, for suggesting remedies. To-day, then, because of the change in status of the accountant from clerk to professional, the possession of a clear understanding of the economic ideas underlying sound managerial decisions is necessary if the accountant is to be an executive."

I think all of these viewpoints tend to clarify the educational requirements established for U.S. Steel Industrial Accountants.

A bachelor's degree is the minimum requirement for employment directly into the U.S. Steel training program. Men with post-graduate credits, particularly where it serves to broaden rather than to specialize their undergraduate field, normally will be given additional consideration. Broad economic and management subjects are desirable rather than excessive specialization in professional accounting subjects.

DEVELOPING APPROACHES

To-day we find these higher level problems being discussed and studied under such titles as Administrative Accounting, Financial Accounting, or Management Accounting. This latter term is probably the one most widely used. It carries wider significance too, due to the fact that the Institute of Cost and Works Accountants of Great Britain

has established a Fellowship degree in Management Accounting—a post-graduate award. Education towards this end needs to be carefully thought through in our own Society. Since accountants with other degrees are also employed in industry, any program should also be open to them and, of course, it would be preferable if it were a jointly developed program—another reason for unification. Since we have a unique situation in Canada we're going to have to work out our own solutions. The Executive Development Program fits into this picture as a partial solution. Probably of even greater importance is the work being done by our universities toward providing this kind of education in a manner and at times suitable for men in industry. The Banff Management School is well-known for its work, and the University of Toronto has its Administrative Development Program—an evening plan covering nine subjects so that the complete program can be covered over a period of a few years. Many other universities are offering similar programs to-day.

Our greatest efforts have been made through our Educational Foundation. By this means we have been able to pay for high level study of our educational program and requirements through Calvin Potter, and this work is already bearing fruit in our course. There is, however, a real financing problem. In the last three years we have spent $15,500 on the research and development of new courses and, even so, we are committed to another $21,000 for similar work over the next two to three years. Isn't this a problem that would be substantially solved by unity within the profession? We must be only one of the accounting bodies who are doing the same thing with consequent duplication and waste.

In addition to the educational curriculum, etc., we must provide more support for the fundamental research being carried on at universities towards the establishment or refinement of principles.

SERVICE

While I have left to the end treatment of public service, I do not mean to imply that it may not be first in fact. It is just that I think that fullest opportunity here is dependent upon progress in the previous two. On the other hand, we will never truly rise to full professional status until we win it through active public service. While this end will be best attained on the corporate basis when the accountancy profession is in being, it's clear that the challenge must be answered increasingly by members individually, on the national, regional, and local levels.

To me, of course, this is only another approach to the fact that we are men first—before we are professionals—and we have a duty to God and to our fellow-men to use our talents and abilities to advance God's kingdom on earth. We are endowed with diverse capacities to minister in diverse ways—to cultivate this garden in all areas in which we are involved—homes, community, at work, and in the nation. And unless we are all alert to this duty first, we could even find our professional power working against God's purpose rather than in harmony with it.

Engraved on the stonework in the two new beautiful auditoriums at Calgary and Edmonton you will find this statement—"He found the city built of brick—he left it built of marble."

May each man in our Society so conduct himself towards unification, education and service that this statement will clearly apply to him.

The Economic SCENE . . .

by W. Allan Beckett

POPULATION AND PROSPERITY

One day last Spring—about mid-April—Canada's population passed the 17,000,000 mark. Each month the number swells by another 35,000—the equivalent of the addition of a city the size of Guelph, Ontario, or Sydney, Nova Scotia or New Westminster, British Columbia.

Over the year, our growth may reach 375,000, (it was 500,000 in 1957 when immigration was high and has averaged about 400,000 since 1951) approximating the size of Vancouver city. In less than three years, we will pass the 18,000,000 level, which is almost the same as adding another city the size of Montreal proper.

Truly, such an increase in population is phenomenal. But what are its implications for future economic developments? It was once thought that population growth would result only in lower living standards. If the standard of living rose above a bare subsistence level, people would have more children and standards would be pushed back toward the minimum level.

Events have long discredited such a notion. We have found that we can have population growth *and* economic progress—more people and higher living standards per head. This combination is, in part, a function of a land rich in resources and a population skilled in technology.

The substantial growth of the last 15 years has been a product of three main factors. In the order of their importance these are—higher birth rates, higher net migration, and lower death rates. The combination of relatively more births and relatively fewer deaths has meant faster growth in net natural increase of the native population. In the period 1951-1955, net natural increase was equal to 19.5 per 1,000 population, almost double the rate of 10.8 in the period 1936-1940. Net migration to Canada has risen both because of higher immigration and lower emigration.

It is not merely the size of the total population or its rate of growth that have implications for future economic progress but also the characteristics of that population, particularly its age composition. Here we find both comfort and disappointment.

The disappointment is the relative contraction in the age group from 18 to 27. There are actually fewer people in this 10 year age group than there are in the same size groups below and above. This decline reflects the low birth rates and restricted immigration during the period of the great depression, 1931-1940.

Thus in the period 1936 to 1940, the crude birth rate was 20.7 per thousand. By 1951-1955 the rate had increased by almost a third to 28.0. Those who were born in the earlier period are now 18-22; birth rates were also low in the preceding five years from 1931-1935.

The implications of this hollow are rather important. Other things being equal, it means that there are fewer people to get married, fewer families formed and ultimately fewer births. Markets for many important industries—housing, automobiles, furniture and furnishings, diapers and milk—may feel the pinch as the trough in the population pyramid slowly ages. In 1958, the lowest single age group is the 22-year-olds, with 20-24 inclusive being the most depressed five year group. It is this group that contains a large proportion of first time buyers for the items already mentioned—especially cars, houses and furniture.

The decline in the importance of this age group has already become apparent in marriage rates. The number of marriages was inflated somewhat right after the war because of war-time postponements and in the period 1946-1950 the rate reached 9.8. By 1951-1955 the rate had fallen back to its pre-war (1936-1940) level of 8.7. It has continued to decline with absolutely fewer marriages in 1958 than last year. The final impact may be to produce a drop in the birth rate in the years immediately ahead.

But there are brighter times ahead. If the 18-27 age group is relatively depressed, there is a substantial bulge in the under 18 group. Today this means bigger and better markets for those who produce and sell to the 'teen market and even bigger and better markets tomorrow because the size of these groups increases as the age becomes younger. Birth rates have continued to rise into 1958 and at least a 15 year bulge is succeeding the ten year hollow.

Industry must look ahead, too, to the time when the now 'teenagers reach marriageable age and once again swell the demand for houses, cars and playpens. The number of 21-year-olds reached its maximum back in 1945 (246,000 survive today). This number will be exceeded again in 1962 or 1963, and the number in that age is beginning to increase slowly now.

A word should be said about another important age group, those 65 and over. This group continues to grow both absolutely and relative to the total population. Improvements in private pension plans and public social security have concentrated more purchasing power in this group. While basic necessities will continue to bulk large in the expenditure patterns of the aged, a new market is developing. Service industries, especially in travel and recreation, can expect to benefit.

The shifting age composition of the population must form an integral part of market analysis for a wide area of industry. As this article has shown such shifts may produce temporary problems for some industries while markets in other areas will expand rapidly.

If you work for a man, in heaven's name work for him! If he pays you wages that supply you your bread and butter, work for him—speak well of him, think well of him, stand by him and stand by the institution he represents.

—Elbert Hubbard

Intelligence is quickness to apprehend as distinct from ability, which is capacity to act wisely on the thing apprehended.

—Alfred North Whitehead

I often wish that I could rid the world of the tyranny of facts. What are facts but compromises? A fact merely marks the point where we have agreed to let investigation cease.

—Bliss Carman

EXECUTIVE DEVELOPMENT*

By Lyndall F. Urwick,
Chairman, Urwick, Orr & Partners Ltd.,
London, England.

It is the responsibility of management today to train the business leaders of tomorrow and management is asking: How is a good executive selected? What qualities should he have and what can be done to further his education, business and social experience? How many executives should be trained and on what basis should they be promoted? These are among the leading questions answered by the author in this article.

The general subject for this discussion is what is called, for want of a better term, "Executive Development". I propose to introduce the subject by propounding certain quite simple questions bearing on the idea of "executive development".

Why should anyone bother about executive development? For quite a simple reason. We are, all of us, ephemeral: we are all limited to our "little hour". Almost the only certain and universal fact that we know about every human being is that he or she is going to die.

But the businesses in which we serve are, at least in theory, eternal. They are "immortal corporations". That means that the lives and fortunes of many of our fellow men and women, the friends and colleagues of the working part of our lives, are bound up in the capacity of these businesses to survive. The least we can try to do for them is to see that our inevitable passing does as little harm to their futures as possible.

We can only hope to secure this by constant attention to the selection and training of future managers, by doing everything that we can to ensure a continuity of leadership in the undertakings in which we serve. It is true of businesses as it is of nations that "where there is no vision, the people perish". It is the responsibility of managers at all levels to keep that vision alive—to keep alive in the hearts and minds of all those who work with them and under them, the worth and dignity of the task in which they are engaged together. We are all beginning to realize that in business, as with individuals, the most fatal disease is the subtle and universal onset of "middle-aged spread" and the only thing that will save any organization from this danger is a constant flow of up-and-coming young leadership.

In the long run, businesses are made or broken not by markets or capital, patents or equipment, but by men; the first syllable of management is man. Therefore in looking

* This address was given at an executive development seminar held at McMaster University in April, 1958.

Author of 40 books and some 250 articles on management and related subjects, Lt. Col. Lyndall Fownes Urwick is one of the pioneers and foremost authorities on scientific management. Founder of the management consultant firm of Urwick, Orr & Partners, he has received international recognition for his services to management and has held many distinguished positions on management advisory committees and as officer and member of a host of societies for the advancement of management in England and abroad. A graduate of Oxford University, Col. Urwick holds the Order of the British Empire.

after "key" manpower in your businesses, you are providing them with the only form of insurance which is valid, the most valuable form of insurance which money, time and effort can buy. It will demand of you all these things. But, if I might venture to touch on a higher note, if you attend to this one point, you will earn the only reward which is not as ephemeral as you are, the tribute of those who know you best, "well done, thou good and faithful servant".

QUALITIES OF A LEADER

In the selection and training of future leaders what are you looking for? The thing we are all looking for is leadership. Now leadership is often described as an "intangible something". But whenever I hear anyone describing an influence as "intangible", I know that he has no idea of what he is talking about. Some years ago, Sir William Slim spoke for ten minutes to the Sydney Division of the Australian Management Association. He said that "Whether it is in business or in the army, the essential qualities required in a man, whether he leads ten men or ten million, are the same". There are five qualities and these are:

1. COURAGE.
2. WILLPOWER—because it is extraordinary the amount of opposition you will meet when you want to do anything. Many of your own staff will insist out of loyalty for you that you play for safety. You have to get over that.
3. FLEXIBILITY—because we are living in a rapidly changing world. Without flexibility of mind, strength of will is a danger.
4. KNOWLEDGE—that doesn't mean that a manager has to know how every machine in his department works, that he has to know more about a machine than the man who handles it. But he has to know enough to appreciate the difficulties of his subordinates, the time taken to do certain things and the sort of help they will need.
5. INTEGRITY—the fifth quality on which all other qualities must be based is INTEGRITY—the thing which makes people trust you.

I was very glad to note that my friend Peter Drucker, in the best book about management which has come out of the U.S. in the last decade, mentions this word "integrity" 28 times, as the essential quality. He said, "The best practices will fail to breed the right spirit unless management bears witness for its own professed beliefs every time it appoints a man to a management job. The final proof of its sincerity and seriousness is uncompromising emphasis on integrity of character."

My own experience in life is that the most brilliant managers are quite useless, and even a menace to the organization, unless they have integrity; they are no use to anyone.

WHAT TO LOOK FOR

You want these five qualities. You have got to ask yourself, "Can this young man develop these five qualities?" What can you look at? First of all heredity—we have all got breeding of some sort; you don't buy a horse or dog without looking at its breeding. Human breeding is much more difficult to look for. One writer has observed that it would be a great advantage if human genealogies were recorded through females; we should then be certain of at least one of the parents. But it is usually possible to form some idea of what a man's ancestry looks like. I don't mean that he should have royal blood

etc., but a decent strain behind him. Not that you should turn a man down because he was not so lucky about one of his parents. Indeed the reverse often holds good. If a man of humble parentage by about 24 or 25 years of age has gone some way, acquired a good education and so on, that is one of the few objective indications that he has some of the determination and willpower that you are looking for in a leader. He has made a lot of limited opportunities.

Secondly, we look at environment—where born, where living, occupation of parents, religion, intelligence etc., ask about brothers and sisters, what they do, what place he has in the family.

Next, formal education—educational grades and subjects; type of education and under what conditions—resident, non-resident or part time. What subjects taken—general, technical or managerial.

Then look at social experience—home, communities of residence, educational groups, work groups and other groups with which he has been associated—intellectual, military, professional, recreational, religious. There are a lot of facts you can get about people.

Finally, ask about job experience. Job experience can be analyzed simply—a man's experience has been OPERATING—which can be either preparatory, unskilled, semi-skilled or skilled; TECHNICAL—which can be operating, supervisory or managerial, or MANAGERIAL—which can be either preparatory or executive.

I believe job experience can be analyzed as either unsatisfactory or satisfactory, superior, or outstanding. "Satisfactory" means that you promote him in due course. "Superior" means that you promote him as soon as you can. "Outstanding" is tricky. It is difficult to make up one's mind that an individual is head and shoulders above his contemporaries—the kind of creature who will make a success of it, whatever you throw at him. There are only a few of them. But there are some, and it is important that they should be picked out and promoted quickly.

FINDING EXECUTIVE MATERIAL

Now, at whom should you look? I say you should look at everyone. Leadership is a rare and very valuable asset; you cannot afford to lose any of it in your organization. Men develop the essential qualities at different ages. Therefore you should look at everyone and ask yourself two questions. Is he likely to grow into a leader? Will he want to make the effort to grow into a leader? You cannot develop leaders: you can only help potential leaders to develop themselves.

When should you look? I think first, as recruits. Potential managers at 22 or 23 years fall into all kinds of groups; one may have a university degree and be the best man on his educational experience, but have no practical experience; on the other hand there may be a man with only primary educational standards but a lot of practical experience. Possibly he may have been working since age 16 or 17 and have had five or six years' business experience. The fact that he has not had an education does not mean that he is not suitable. He may have more leadership potential than a man with much higher educational qualifications. We should never forget that different people develop at different ages. I have always tried to warn people against setting up neat little administrative hurdles and considering only people with certain standard qualifications. At 18 years or so a boy with leadership qualities may be tangling with the local police or experi-

menting with the opposite sex. He is learning something that may be very valuable to him later on. One sees so many cases of boys who, before the age of 20, are the very opposite of the "industrious apprentice"—his parents' joy and his teachers' hope of advancement. Then, suddenly, something happens—perhaps they marry the right girl. They become quite different people. It is possible that some of these people, these "late developers", may have this spirit you are looking for. I say, look at everyone for this rare quality of being able to lead other people.

But, having looked, remember that different people want different things. The boy who has had a great deal of education but no practical experience needs practical experience. On the other hand, the boy who has had only practical experience needs help to gain the education he missed in earlier years. He needs encouragement and assistance from his manager in making that effort: to make up educational limitations later in life is a tough job. I think that individuals in this group who have qualities of leadership should be marked down early and given positive assistance, including if necessary, full-time educational leave at the expense of the employer.

Maybe you will lose a few of them to other people. But, generally, the organization that takes a generous view in such matters always finds that it pays off. Once you have got a reputation for making people, the best young people come to you and you are never short of good men. You may lose your investment in certain people here and there. But you may be sure that the total investment is never lost.

IS THERE ANY AGE LIMIT?

I think these people should be reviewed annually at least up to the age of 30. I have given 30 as the deadline, because I don't think that a man who has neglected the educational part of his equipment past 30 has nearly so good a chance of catching up. One sees so many cases of good men who have got up to a reasonable position though the ranks—charge-hand, foreman, general foreman, perhaps departmental manager. Then when they are about 40 or 45 years old a high level job comes up. The individual is given the job, though with a little uncertainty because it is not clear that he has the educational background: nine times out of ten it smashes him. Hollywood said it—many years ago—"You cannot groom elderly spinsters for stardom". That applies to managers as well as to film stars: after 30 it is usually too late.

There are, of course, exceptions. There was the late Sir William Robertson, who was a sergeant in the British Army at the end of the last century when he was 30 and a Field Marshal and Chief of the Imperial General Staff before he was 60. There was Sir Horace Wilson, a clerical class entrant, who became Head of the British Civil Service before he was 55. These were men no one could stop. There are always notorious cases of men nothing can stop. Don't let's judge by these exceptions. Let us always keep our eyes open for men. But let us remember that, on the whole, men over 30 who have not begun to make up on educational inadequacies are quite likely to develop into "problem children".

SELECTING THE EXECUTIVE

I am not going to say anything about selection except please don't imagine that a psychologist or psychological tests are going to solve this problem of selection for you. People, especially in the U.S.A., are inclined to become excited about elaborate tests and

procedures for assessing people: in every case it seems to me that they are trying to substitute gimmicks for responsible judgment. You should never turn a man down on the opinion of a single executive. Because one superior does not approve of him or because someone doesn't like him, does not mean that a man is unsuitable. Try him elsewhere. Never condemn a man on a single opinion. How far should this process be taken? Well, a good rule is "three times is a lot".

In Great Britain, many of us sympathize with Dr. Johnson's comment—"God Almighty, Himself, Sir, does not propose to judge man until the end of his days". Selecting and assessing people is one of the few things that are better done by a group than by a single person. I have always insisted that selection should be a group process. There is not a man in our own organization of whom it has not been said at some time by someone, "This man will never make a consultant". I think this is also true of most organizations. So don't turn a man down on a single opinion, always use group processes in assessing men and let them know the results of the ratings, otherwise how can they improve themselves?

How many should you select? I say that any business should train and select four times its estimated future requirements in managers. Of any 100 potential managers, at 20 years of age, 25% will be dead or totally disabled before 60. That is an actuarial figure. On top of this at least another 25% will wilt on the way; something goes wrong. They marry the wrong girl, become alcoholics, develop heart conditions or ulcers, prove financially unreliable or around about 40 they just stop. So that takes care of two out of your four. And I think that for every responsible job there should be two candidates. You may lose some of those who don't get promoted, but that will be a good thing for business as a whole. We must all do our share to keep the market supplied with trained people. They will be better managers for the training you have given them. I have yet to meet the business that went bankrupt because it had too many good men.

WIDENING JOB EXPERIENCE

What can you do about training? There are three things you can influence—job experience, social experience and education in management. Far the most important is job experience. There is nothing trains a man so fully as performance on the job. No factor builds up confidence and character in a young man so quickly as awareness that he is tackling progressively more and more difficult jobs and getting away with it. This part of a man's training depends upon his immediate superior.

There are five things a supervisor should do:

1. Establish a team feeling in his group.
2. Create mutual confidence between himself and the young men he is bringing forward.
3. Advise his subordinates wisely.
4. Demand high standards of performance.
5. Make challenging opportunities for the individual.

We can all help to build future leaders by doing these five things and this is the most important part of executive development. They can be supplemented by creating other working opportunities for the individual. You can give him special tasks—making a special inquiry, preparing a report, visiting other plants, becoming a member of a working committee. Young men are challenged by special tasks to which they can devote personal interest.

Don't overdo job rotation: this is a definite mistake. Young men who are any good need real life, actual responsibility: they loathe job rotation. Job rotation is a nice, cheap, easy way of persuading yourself that you are training men. But is not a very intelligent method of really doing so. In my opinion if job rotation is used, it should be for short periods only as an induction process. If someone is away on a month's leave a person should always be posted to that job. This is a great way of testing a man's ability. Let him replace his superior for brief periods when he is away, vacations, etc.

Allow any progressive and promising youngster to feel that there are more and more opportunities opening up every year. How does he perform when out on his own? How does he shape up with people? Does he really try to understand them? Express interest in his health—not a fussy interest but a sensible one. A great many people fail to realize that their health is an asset and essential for first class performance; they should be encouraged to take good care of it.

The productivity of an executive is his total production over a lifetime, not his production over a few years. It is quite unnecessary for the modern executive to work himself into the ground: he should try to work a reasonable work-week and he should watch his health. Then he can take an exceptional strain when it's really necessary.

SOCIAL AND MANAGEMENT EDUCATION

How can we widen a man's social experience? We can encourage him to take part in public speaking, in seminars and conferences and community work, etc. There are all sorts of opportunities in community work where young men can learn to grow socially. He can be asked to act as instructor for internal/external training classes. He can undertake professional teaching work. Generally he should be encouraged to participate in social activities. Social experience is not an inherent quality: it can be acquired. If taken gently, young people can be guided through the first difficult steps and become totally different. People are not naturally gauche, only shy: they need a push now and then.

How can you help a boy in his actual management education? First of all make clear to everyone that you as an employer or manager do not regard a knowledge of the principles and practices of modern management as something phoney or a fad which he can study if he wishes but which has no bearing on his career with the company. On the contrary, you regard such knowledge as an essential part of the equipment which will be expected if he is to hope for advancement. Time and effort spent securing it will be viewed not merely as a selfish ministering to his personal activities but as an integral part of the development of the business and, therefore, of the duty of the individual which he owes to the organization. Show that you are prepared to help individuals in this task. There are many ways in which you can do this. You can collaborate with other employers and with education authorities to conduct courses, seminars, etc. Encourage employees to sit for external degrees; this may require five or six years of night school. They won't do it without your help. You can even grant full time leave-of-absence for part of the period to really promising people.

Send men away to other firms to obtain training. Organize your own classes if the business is big enough to afford it: this is probably the best method and may pay you hands down. Encourage employees to participate in the activities of the professional organizations in the management field.

You can also encourage them to do some private reading about management. Reading

should be selective, not every business magazine or article printed. There is an excess of reading material at the present time: over 10,000 books on the subject were published in the U.S. last year. Most of them were by professors who think they all have to write books to satisfy their presidents that they are doing "original work". If Professor A from University X writes a book of 1000 pages in 1958, then Professor B of University Y writes one of 1100 pages in 1959. It is easier to produce evidence of work than of originality.

Then there are the new sciences who want to show that they are useful to business. Their young men write books, but never in a language that anyone else can understand. That is half the fun of being in a new science, like small boys with a secret language. So there are the popularisers who, in turn, write books to explain to the general public what the new scientists have been writing about. The function of a book is to be easy and convenient to read. But some of the books being printed about management can't even be carried in a brief case. I understand many executives are now taking lessons in how to read more words per minute and to understand less. This excess of literature is really confusing people very much.

However, even the smallest company can afford a small library of management books placed at the disposal of employees, even 50 *selected* books. This is one of the greatest services that can be rendered to the staff, provided that young men are given guidance as to what they should read. Advise them carefully with regard to selection. Every plant should see that it has such a library.

You can get help in these tasks from each other, from professional institutions, etc.

THE PROBLEM OF PROMOTION

What is likely to be your worst problem? The problem of promotion. Human groups always want a moderate amount of promotion for the maximum number of people with great emphasis on seniority as the basis of selection. I judge this from watching the demands of Civil Service staff association in different countries: with these groups wages are pretty well set. That problem is settled. So these groups are vitally interested in promotion. In future, as countries establish national wage systems, the problem of promotion is likely to play an increasing part in Trade Union policy.

Do we realize how serious this problem is? If you allow a man who has the character to go to the top to get much past 30 without adding the educational equipment he needs, by the time he is 45 he will probably be disgruntled. You have to pick the uncommon man young enough and get group acceptance for your choice. And, if you do not pick some of them young enough, they will not have the required experience when you need them for really responsible posts. What do you do about this uncommon man when you want to promote him and the group won't take him? If the group won't accept him it does not prove that he is unsuitable. For example, Winston Churchill was most unpopular with the British democracy when he first became a Junior Minister at the age of 31. If it hadn't been for this unpopularity, Winston Churchill would have been in power and leader of his country perhaps ten years earlier. It is probable that if he had been in power between 1930 and 1935 there would have been no second world war. That is a case of what happens when the uncommon man is not accepted by the group.

It is much easier to promote the obvious person and not the uncommon one. When Trade Unions come along with this problem, then we shall have to do something about it. We shall need a system of ensuring that enough of these individualistic, uncommon

young men are promoted early enough. The brash, "awkward" young man should have experience of responsibility early enough to be ready for great things by the time he is 40. Unless we give him opportunities deliberately he won't get the experience.

I think we could have such a scheme on the principle that of every four promotions, say from level G to level F, two should go to the obvious people—the senior men at level G who are fit for level F and the people whom everyone expects to be promoted. A third might go to the most suitable man at level G, who by age and ability might be capable of promoting ultimately the level C. The fourth should only go to a man who by age and ability might be capable of promotion ultimately to level A. In the last two cases, the fact that either of these men were not the "obvious" people to be promoted from level G to level F should be ignored.

We must keep a balance in our minds between the promotion of the normal, obvious people and the need for exceptional people.

For further reading

DEVELOPING THE EXECUTIVE OF TOMORROW, by Myles L. Mace, AMA General Management Series No. 187

DEFINING OBJECTIVES IN MANAGEMENT DEVELOPMENT, by H. J. Phillips, Jr., AMA General Management Series No. 173

PROGRESS TO DATE IN EXECUTIVE DEVELOPMENT, by Virgil K. Rowland, AMA Personnel Series No. 145

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PUNCHED CARD SYSTEMS: YES OR NO?

By Charles Moller,
Management Consultant,
New York.

With more companies mechanizing every day, most executives and department heads will ultimately face the problem of whether to join the trend. This article, based on the actual experiences of small and medium-sized organizations with punched card installations, provides an impartial insight into many of the practical problems, and advantages, of such an installation. The normal costs of operating a punched card system are estimated and the main prerequisites outlined.

This is an attempt to describe some of the experiences met by medium-sized organizations in introducing mechanical procedures for commercial and production controls. As only the punched card system, generally speaking, will be feasible for the present for small and medium-sized enterprises, our remarks will be confined to this aspect of the subject.

A frank discussion of the "pros and cons" of such an introduction should prove of considerable interest to the many executives and department managers who, at one time or another, will have to decide whether or not to change over from manual to mechanized procedures. The change-over is a big step which will subject the company concerned to considerable upheaval, difficulties and expense—a fact which must be faced squarely. It is one thing to discuss these intricate questions with a salesman of any one of the punched card systems now on the market, and it is quite another to arrive at sensible and objective answers based on the existing circumstances of an organization and past experiences with similar types of installations. We are therefore going to enumerate, as objectively and precisely as we can, the *advantages and disadvantages* of such a system, its normal *costs and requirements*, and the main *prerequisites* which will largely determine the success or failure of the system.

DISADVANTAGES OF MECHANIZATION

A punched card system requires a *minimum* of three machines; a punching machine, a sorter and a tabulator. This requires the installation of a machine department, just like any other machine shop in the production line. Any such department demands a program, a system, and procedures and controls of its own. These must first be planned, established, and then integrated with the systems and procedures of those departments involved. This *integration* is one of the big difficulties which no manual system presents to a comparable degree.

The question then arises whether it is best to *adjust the punched card system to the existing procedures* or vice versa. The extreme policy in either direction is dangerous because

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Charles Moller was born in 1907 in Prague; studied Commerce in Vienna and Law and Political Science in Prague. He had banking, insurance and legal experience when he came to the United States, after a short stay in England in 1940. After varied experience, particularly in the watch-making industry, Mr. Moller went on a two-year management consulting assignment in Switzerland, from which he returned recently to New York where he is engaged in consulting work.

a complete adjustment of the punched card system to the existing procedures will render the system ineffective, while a complete alignment of existing procedures to the punched card system will meet heavy resistance in the organization. Thus a happy medium will have to be found.

Another difficulty is the *rigidity* of any mechanical process as compared with manual procedures: machines work quickly, accurately and uninterruptedly, but only according to a pre-set program. Of course, this program can be changed by readjusting the machine, but this may cause a major interruption of the machine-run, and at times poses considerable problems. In most cases, punched card machines are regulated by electrical connections which can be removed and replaced, but it is not always possible to prepare the necessary connections in advance for exceptional problems as in the case of normal, routine transactions. A switch from one activity to another is easy for manual operations, but usually a lengthy affair for machines and that is why a system like this can never be expected to fire answers at short notice.

A further drawback of such a system is its *high cost:* the machines involved are usually complicated, delicate and expensive, whether they are leased or purchased outright. Then there are the administrative costs of maintaining an additional department with its head and an appropriate number of employees. It would seem simple enough to calculate the number of employees required by dividing the total number of anticipated operations by the known capacity of the machine of so many operations per hour. Unfortunately, however, the running capacity of these machines does not include the time necessary to feed the machine, to switch from one operation to another, and for trial runs. One must allow for regulating the machines, running repairs, and delays due to human errors, breakdowns, etc. Then there must be a certain reserve so that operations can continue, even if one or more of the employees are absent. The punched card department must carry on at all times because, by its very nature, it is given those tasks which *must* be completed within rigid time limits, i.e. preparation of wages, workflow controls, cheque issues and billings.

Still another, though perhaps minor, difficulty is the fact that if the resources of such a department are to be exploited in full, it will have to be entrusted with tasks of a confidential nature and it is not always easy to obtain the necessary *discretion* from every member of the machine accounting staff.

Finally there are the *psychological problems*, which should never be underrated. The success or failure of a switchover such as this depends to a great extent on the cooperation of the departmental heads concerned. It is there that a double resistance is often encountered: the normal human reaction to any change whatsoever and, more serious, the fear of having one's own functions reduced. This fear is justifiable to a degree because part of the controls and statistical functions of the departments concerned will inevitably be taken over by the punched card system. Often lacking an overall picture of the organization, the departmental head is not properly aware of all the benefits offered by a punched card system, and unless the situation is handled carefully and psychologically from the start, serious opposition will be met.

In handling such problems, there are two vital prerequisites: first, it is absolutely essential that management backs firmly, and continues to stay behind its decision to install the system; and second, the department heads must be made a part of the whole new procedure. They must be given the feeling that it is *they* who need the system, *they* who have the necessary ideas, and *they* who are laying the groundwork. This is certainly not easy

to achieve, yet it must be attempted at all cost, for only in the rare exception should management have to step in and enforce its decision, even against the opposition of the lower echelons.

ADVANTAGES OF MECHANIZATION

On the *positive* side of the picture there are many compelling points, the foremost being that the performance of the various controls and evaluations is removed from the individual departments and concentrated in a separate, *impartial* department, working solely on the basis of original documents supplied by the various departments. This is an advantage which is very much appreciated, especially by top management in larger concerns.

Then of course there are the advantages of *speed* and *accuracy*. Punched card machines work at speeds which, prior to the introduction of electronic machines, were considered the limit. The latest sorting machine, for instance, processes up to 60,000 cards an hour; the latest tabulator processes up to 120 cards a minute. These performances cannot possibly be matched by human procedures, either in speed or accuracy, and moreover, machines can maintain this output for an unlimited period of time.

Another advantage is that similar transactions can be processed mechanically in *any number of directions*, (limited only by the capacity of the cards) eliminating the many regroupings and rewritings required by any manual system. The basic data are translated into holes, which are sensed by electrical means, enabling the machine to group, regroup, add, subtract, or even multiply and divide the data in accordance with a pre-set program.

The speed and accuracy of the machine operation result in *greater economy*, provided the number of identical transactions to be processed is sufficiently large. For example, say there are 10,000 invoices to be processed and management requires two evaluations, i.e. one per customer and one per article sold. Let us assume there are 2,000 customers and 5,000 different articles, averaging three articles per invoice. If done manually, the bills will first be sorted by customer and then by article. In the latter sorting, the bills will have to be cut up in strips per article and then computed or else copied onto a distribution sheet, segregating the various articles. This would take at least 300 hours or a week's work for eight employees. Then the figures would have to be distributed and added, taking another 120 hours or an extra week's work for three employees.

When done by punched card machines, the sorting will take about five hours, the perforating and verification about 200 hours, and the tabulations about 70 hours—a total of approximately 275 hours as against 420 man hours and, once punched, the cards remain available for future evaluations.

WHEN IS MECHANIZATION JUSTIFIED?

Having weighed the advantages and disadvantages of a punched card system in the light of an organization's special circumstances, the circumstances themselves must be investigated closely, since they might not lend themselves to mechanization at all.

In punched card mechanization, where a large number of transactions are processed without interruption, the *larger the number of identical transactions* transferred to punched cards, the *more economical* will be the running and the more striking the results. It follows, then, that the more varied are the basic business transactions and the more exceptions there are to a basic procedure, the less economical will be the running of the system.

Provided the volume of operations is large enough, an ideal application for punched cards, for instance, is the *wage administration* in a production sector. Here all the basic

transactions are identical (except such individual specifications as number of worker, name of work-centre, number of operation, etc.) and easily transferred to punched cards for processing. Any change in the basic data occurring during a pay period, however, will necessitate changes in the pre-punched cards, thus rendering the mechanical processing more difficult.

As another example, however, suppose we wish to obtain certain *order and sales statistics* through punched cards. So long as the sales are billed in much the same manner and the basic data are easily coded into holes, processing by punched card machines will be comparatively easy and economical too—if the volume of operations is adequate.

In many cases, it is the use of pre-perforated cards which makes the system fast and economical. The frame punching is done only once; thereafter the identical data are transferred from the pre-punched card to the new one by automatic reproduction, thus eliminating human labour. If, however, these pre-punched cards are to be changed too often, their advantage will be largely eliminated. For instance, if the customers or the articles sold change frequently in any one period, the difficulties in applying a punched card system will grow proportionately. *One* direct change, such as switching a quantity of items from one customer to another, is accommodated easily enough by substituting a new card for the original. The more involved the changes, however, the more difficult will be the adjustments, e.g. if the goods intended for one customer have to be divided between two or three others, then the original card will have to be replaced by two or three; if, in addition, part of the merchandise intended for the customer should be held back, then one more card, a stock card, will have to be established for the goods thus retained.

These examples serve to illustrate one of the main principles governing a mechanized (punched card) system, that is, the business transactions to be handled should be of a *uniform and basically simple character* so that, when grouped together, the machines may process them uninterruptedly.

It is, of course, very rare indeed to find a living business system where no changes occur at all and no punched card system is so rigid that it cannot handle at least some changes, though these should be infrequent and few. Should a large number of changes occur simultaneously, it might be advisable to process them manually, integrating the result into the mechanized system by special perforation. Such an occurence should be the exception, however, if the adoption of a mechanized system is to be justified.

AN ACTUAL CASE

I would like to quote a case in point from my own experience. In a medium-sized sales organization, it was found that the manual processing and controlling of *customers' orders* from receipt to delivery and billing was a time-consuming and involved operation. The progress of the order was recorded by hand on control cards indicating the five main stages through which the order passed; the original order entry was followed by notations indicating delivery planning, assembly of the various components of the order, passage of the goods to the shipping department and final dispatch. To give a clear picture of the situation at any given time and provide good control, it was necessary to maintain five different card files, which had to be consulted frequently and the information contained therein copied and evaluated.

The need became apparent to have all this information grouped at one central point and it was decided to adopt mechanical grouping and evaluation by means of punched

cards. After careful study, a card was devised which would incorporate the five stages through which customers' orders passed. On receipt of an order, this card would be punched for every item ordered and filed in a special cabinet, containing all "customers' orders accepted for processing." At any time then, a statement could be compiled from this cabinet by the tabulator, giving all customers' orders accepted over a given period and grouped by customers, and/or articles.

When a particular order was programmed for execution, a notice would be sent to the punched card department. There the relevant card would be transferred from the "accepted order" file to the "scheduled order" file, having first been punched with a special code, enabling it to be segregated mechanically from those of the preceding stage whenever they might have to be grouped together for special evaluation.

In this way the card would pass from one cabinet to another as the order progressed from:

"scheduled orders" to "preparation for assembly",
"preparation for assembly" to "orders in assembly",
"orders in assembly" to "orders in shipment",
and finally to "dispatched orders" (notification for this last stage being just a copy of the actual invoice).

At each stage the card would again be punched with a specific code permitting its segregation from all the preceding groups of cards.

At any time, from the various cabinets, valuable information could be extracted by means of the sorting and tabulating machines, i.e.

A statement of scheduled orders by customer and/or articles,
A survey of all goods in the shipping department awaiting dispatch by customer and/or articles,
and finally, sales statistics could be compiled from cards which had completed the cycle, as they would contain all the necessary information, such as name of customer, article, quantity, date of order and of delivery.

It was even decided that space would be left on the cards so that later on cost price and sales price could be added, which would permit the punched card department to compile "turnover" and "gross profit" statistics.

COMPLICATING FACTORS

This then, was the way in which the punched card department would work . . . theoretically. In practice, however, grave difficulties cropped up which, until finally overcome, almost completely paralysed the whole operation!

In such a system it is essential that *all* transfers of customers' orders from one stage to another be signalled *immediately* to the punched card department. Otherwise the statements emanating from the punched card department will be incomplete and unreliable and nothing is more damaging to a system than that. A great deal of thought and planning, therefore, must go into the establishment of a smooth-running *communications* system, which demands the wholehearted support of the departments involved. The slightest inexactitude or delay in getting information to the punched card department, whether through ill-will or ignorance, will at once reflect in its work and discredit the whole system. One cannot, therefore, over-emphasize the importance of meticulous communications planning, both from the technical and psychological points of view.

Another difficulty involves the pulling and refiling of cards from one cabinet to another

which is a manual operation. In our example the manual element cannot be completely eliminated and the question arises—at which point does the proportion of manual work become too great to justify the existence of a mechanized system?

In my opinion this point is reached when the time required for the manual preparation of the mechanized operations reaches *about one-fourth* of the time required to process the whole operation in the punched card department. This figure is merely a general yardstick, of course, and may vary with the organization.

Moreover, once a card has been misplaced, which is bound to happen in manual operations, it is a major problem to rectify the ensuing confusion. In any mechanized system the slightest errors will have disproportionately far-reaching effects and every effort must be made to avoid them as much as possible. The system should be based, then, on "self-enforcing" and "self-controlling" manipulations.

"Self-enforcing" means that operations are arranged in such a way that the following operation automatically enforces the preceding one. "Self-controlling" means the insertion of control procedures following every operation which will uncover automatically any mistake which may have occurred.

For example: All notifications arriving in the punched card department should be consecutively numbered so that, when followed in sequence, the notification process is automatically (or self-) enforced. Furthermore: by means of a counter on the sorting machine which automatically registers the number of cards processed, one can check that no cards have been lost or misplaced by running the various groups through the sorter again, comparing the total with the original quantity. Or if we distribute, add, or deduct by machine certain quantities punched into cards, one can always verify by simple tabulation if the sum of the additions and subtractions equals the total of original quantities processed. These we call "self-controlling" devices.

Once a manual operation intervenes, however, the "automatic" control possibilities are lost. In such a case, the machine totals will have to be compared with totals calculated manually by the notifying department or by the punched card department itself. In our example, this would mean that every day for each of the five cabinets, manual additions and subtractions made on the basis of the incoming notifications, would have to be compared with machine tabulations made on the basis of cards transferred from one cabinet to another. This is a lengthy procedure but it is essential that it be done every day or the situation would become daily more confused. Before introducing a punched card system, the possibility of incorporating self-enforcing and self-controlling procedures must be thoroughly studied and the time element closely evaluated.

Another factor is that the basic data to be processed must be sufficiently simple and uniform for *coding* suitable for conversion into punched holes. This code must be simple, clear, uniform, short and standard throughout the organization. Since the punched card department processes data from many other departments, if the meaning of any one code number should vary from department to department, the work of the punched card department would be completely invalidated.

MANPOWER REQUIREMENTS

Two inter-related factors which remain to be considered are the *quality* and *number* of the *personnel* required for the punched card department. The quality of the personnel governs the time estimates for the various operations, and thus the number of persons required. At first sight the work to be performed, both by machine and by hand, seems

straightforward and easily performed, even by unskilled or low-paid personnel. It would appear simple also to estimate the time required for every machine operation by dividing the number of cards to be processed by the hourly capacity of the machine.

But in actual fact, neither of these assumptions is valid. Whilst any individual operation may be easy in itself with no special demands on the intelligence, the fact remains that above-average exactitude is absolutely necessary.

Trifling errors in filing, which would be of no great consequence in the normal correspondence department, can have disastrous effects in the punched card department. In the case of misfiling, the statements extracted from two groups of cards will be wrong, and the search for a misplaced card is a huge undertaking in view of the many cards involved and the similarity of their appearance.

As another example, let us consider the punching operation, which is done on a machine resembling a typewriter. It would seem simple enough to "type" on the card the required information, but first of all the programmation of the machine must be selected and the exact location for the perforations found among the 12 vertical columns and the 80 horizontal lines of the card itself. This too requires concentration and exactitude, and of course the time factor is equally important. A skilled operator should punch about 8,000 holes per hour and if his output is appreciably less, it may become necessary to hire another operator.

Following the punching operation, the cards are verified on another machine to uncover any errors. Since all faulty cards have to be destroyed and repunched, it will be extremely wasteful from every point of view if there are too many errors.

From the verifier, the cards are fed into the sorting machine and collected from the various outlets to which they have been channeled. It is at the collecting point that confusion may occur e.g. the cards in compartment No. 6 may be picked up before those in compartment No. 5. If such a mistake is *not* noticed, all the ensuing work, statements, etc., will be hopelessly misleading. If the mistake *is* noticed, the whole sorting operation will have to be repeated. This means, if we have 10,000 cards and 5,000 articles, the cards will have to be sorted four times, (once for each digit of the article code number) making 40,000 operations to be processed. At the average sorting machine speed rate of 25,000 cards an hour, the operation will take two to two-and-one-half hours, allowing for feeding and refeeding time. This is not in itself the end of the world, but the work of the punched card department is, of necessity, carefully planned in advance and the tabulator, which takes up the work after the sorter, may no longer be free to do so after a three hour delay. In this way, the delay can accumulate until the job may be two or three days behind, all because of one little error in sorting.

It is therefore false economy to cut down on the salaries of the punched card department. A sense of responsibility, powers of concentration, accuracy and an understanding of figures all are essential, and such qualities will seldom be found among low-paid labour. In the end less, but relatively well-paid, personnel will be the ideal solution.

When attempting to estimate *personnel and machine requirements*, it should be borne in mind that the most important machine in the department is the *tabulator*. It is the tabulator that bears the greatest work-load as everything that has been prepared on the perforator, the sorter, the summary-punch and on the calculator must finally pass through the tabulator in order to produce the required control and statistical evaluations. It is therefore the work-load of this machine that will be a determining factor for the whole department.

On the basis of previous business experience then, one must first calculate the number of cards necessary to cover all the business transactions to be processed over a certain period, and then divide this quantity by the hourly capacity of the tabulator, thus establishing its theoretical work-load in hours. To this should be added at least 50% for manipulation of cards and regulation of the machine; this total should then be doubled to reach a more realistic work-load figure, leaving a margin for breakdowns, personnel difficulties, waiting-time, repairs, changes of program, etc. The tabulator, moreover, should not normally be utilized to more than 75% to 80% of its capacity; otherwise, if constantly used beyond this limit, consideration should be given to the installation of a second machine.

As for the *other machines*—in normal usage and on an estimated average, the puncher and verifier should be occupied for about 80% to 90% of the tabulator work-load, the sorter 60% to 70%, the summary punch 40% to 50%, and the calculator 20% to 30%. These percentages will vary greatly with the application and the organization.

On the basis of these figures, the number of operating staff needed can be estimated. There will of course be a department head, over and above the operating staff, and as soon as the machine-park exceeds seven machines (tabulator, calculator, summary punch, sorter, two punchers and a verifier), an assistant supervisor will be necessary. One should also allow a reserve of manpower in case of illness, etc. For instance, if the strict labour requirements are two persons, there should be one other employee in reserve; if the requirements are four persons, there should be a 25% reserve, and so on. These reserve employees can be employed in other capacities when not required.

Thus, for an average installation of seven machines, the following is an estimate of expected monthly expenses based on actual experience:

Machine rental	approx.	$1,000.
Salaries for dept. head and assistant	approx.	900.
Payroll for operating staff (5)	approx.	1,500.
Electrical connection boards and expenses (pro rata)	approx.	100.
Punched cards and special pencils (for "mark-sensing")	approx.	150.
Office, telephone, light, furniture, etc. (pro rata)	approx.	250.
Incidentals	approx.	100.
		Approx. $4,000. per month

CONCLUSION

In this article, we have enumerated the advantages and disadvantages of a mechanized (punched card) system, we have estimated its normal cost to the average organization, and have tried to itemize and define some of the main prerequisites which will determine the success of the system.

In so doing, we have only scratched the surface of this complicated subject, but trust we have accomplished to an extent what we set out to do—which is to call to the attention of top executives and department heads some aspects of introducing a mechanized system which might otherwise be wholly or partially overlooked.

For further reading

A CONVERSION TO PUNCHED CARD ACCOUNTING, by T. P. Morris, N.A.C.A. Bulletin, Aug. 1956.

A FORWARD-LOOKING TABULATING INSTALLATION, by E. C. Zajac, N.A.C.A. Bulletin, Aug. 1956.

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Books in Review...

BASIC MOTION TIMESTUDY

By Gerald B. Bailey and Ralph Presgrave, McGraw-Hill Book Company, Inc., New York, Toronto, London, 1958 pp. 195—including Index. $5.75.

Reviewed by Thomas E. Chappell, R.I.A.

Basic Motion Timestudy portrays a new technique of work measurement developed by J. D. Woods and Gordon in the United States and Canada.

In essence, it relates predetermined times for basic motions to a specific work pace. The development and measurement of basic motion times and their application to actual work studies are thoroughly covered step by step. The definition of the basic motion is the action that occurs every time a body member being at rest, moves and again comes to rest. As in most techniques, it is a question of analyzing all the various motions and eliminating all but the significant motions which actually control the elapsed time.

The second phase of the technique is particularly interesting. Many of the techniques in general use today do not put particular emphasis on the pace or rate of effort. *Basic Motion Timestudy* recognizes that predetermined fixed times have their limitations and that consideration has to be given to the pace in many applications. It resorts to the technique of frequency study or other recognized techniques.

To maintain a constant pace weighting, *Basic Motion Timestudy* times are based on a work pace of walking at the rate of three miles per hour or dealing a deck of playing cards into four bridge hands in one half of a minute.

In a chapter dealing with the variable factors influencing arm reaches and moves, each of the following factors is carefully explained and the weighting developed:

Distance
Visual Control
Precision
Force

The difficult appraisal of force deals individually and in detail with carrying weights, tightening or loosening actions, sliding heavy objects and handling heavy objects with one hand or with both hands.

The authors emphasize throughout the book that it is not intended in itself to make an expert out of the reader. It is intended primarily as a reference manual and can only be appreciated by readers with a reasonable knowledge of the whole time and motion study field.

Summing up, the book is well written with concise illustrations, examples and data tables. The technique described seems very logical and is thoroughly covered but its true value can only be assessed by a practical trial under working conditions.

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